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# PAIR TRAWLING STRIKES GOOD GROUNDS FOR WHITE POMFRET IN THE PALK BAY, TAMIL NADU

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## Introduction

Gear technologists of the FAO Project on development of small-scale fisheries under the Bay of Bengal Programme (BOBP), funded by the Sweedish International Development Authority (SIDA) established in 1980 at Madras have designed and fabricated a two-boat, high opening bottom trawl for pair trawling operations to be taken up in different sectors of the coastal area of the Bay of Bengal. Of the several zones where they introduced this method, as part of a pha sed programme, Palk Bay zone with Mandapam, Pamban and Rameswaram as bases of operation was chosen for experiments during 1980-81. In addition to their trials, practical demonstrations of the two-boat trawling were also given to local fishermen which provided necessary stimulus for the mechanised boat owners to take up pair trawling as a new fishing venture in this part of the country. During the course of commercial-scale operation the mechanised boat owners met with a certain amount of success during the earlier part of their fishing. In early February 1982 a few units each operating from Mandapam, Pamban and Rameswaram landed heavy catches, especially of pomfrets. This generated great interest among the boat owners resulting in intense fishing effort by pair trawling which yielded unusually large catches of fishes mainly rainbow sardines and pomfrets. Pomfrets being in demand as quality table fishes and the landings, as was witnessed during these operations, quite unusual in this region, attention was paid to gather the details and the results of the operations during February to April 1982 are presented.

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## Area of operation

The areas where the pair trawling was conducted are shown in Fig. 1. Fishing was restricted to within 79° 10′—79° 30′ E longitude and 9° 20′—9° 40′ N latitude in the Palk Bay north of Mandapam in Tamil Nadu. The sea bottom in this area is mostly muddy and the depth of operation ranged between 10 to 12 m.

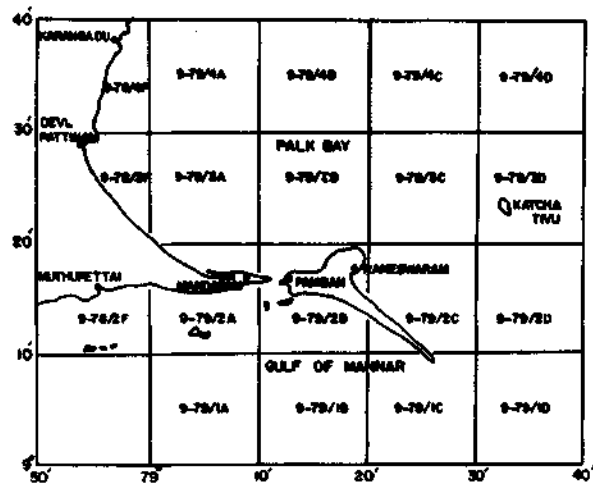


Fig. 1. Map showing the areas of pair trawling operations conducted in Palk Bay off Rameswaram and Mandapam.

## Craft and Gear

Mechanised boats (45 to 70 HP, diesel engines) of size ranging from 9.14 m to 9.75 m conducted pair trawling operations. The vessels have a free speed of 7 knots but at operation the trawling speed of the unit was maintained at 2.5 knots. The boats resorted only to daily fishing between 04 00 to 20 00 hrs due to lack of adequate fish hold facilities and limitations in working deck space.

The design of the two-boat, high opening bottom trawl (Fig. 2) introduced by the FAO is in the form of a conical bag consisting of wings 15.4 m, over hang 3 m, belly 23 m, throat 5 m and cod end 7.5 m with an overall head-rope length of 33 m. The size and specifications of nets used varied slightly according to the power of the engines of the boats. A diagrammatic sketch showing the operation of the net is given in

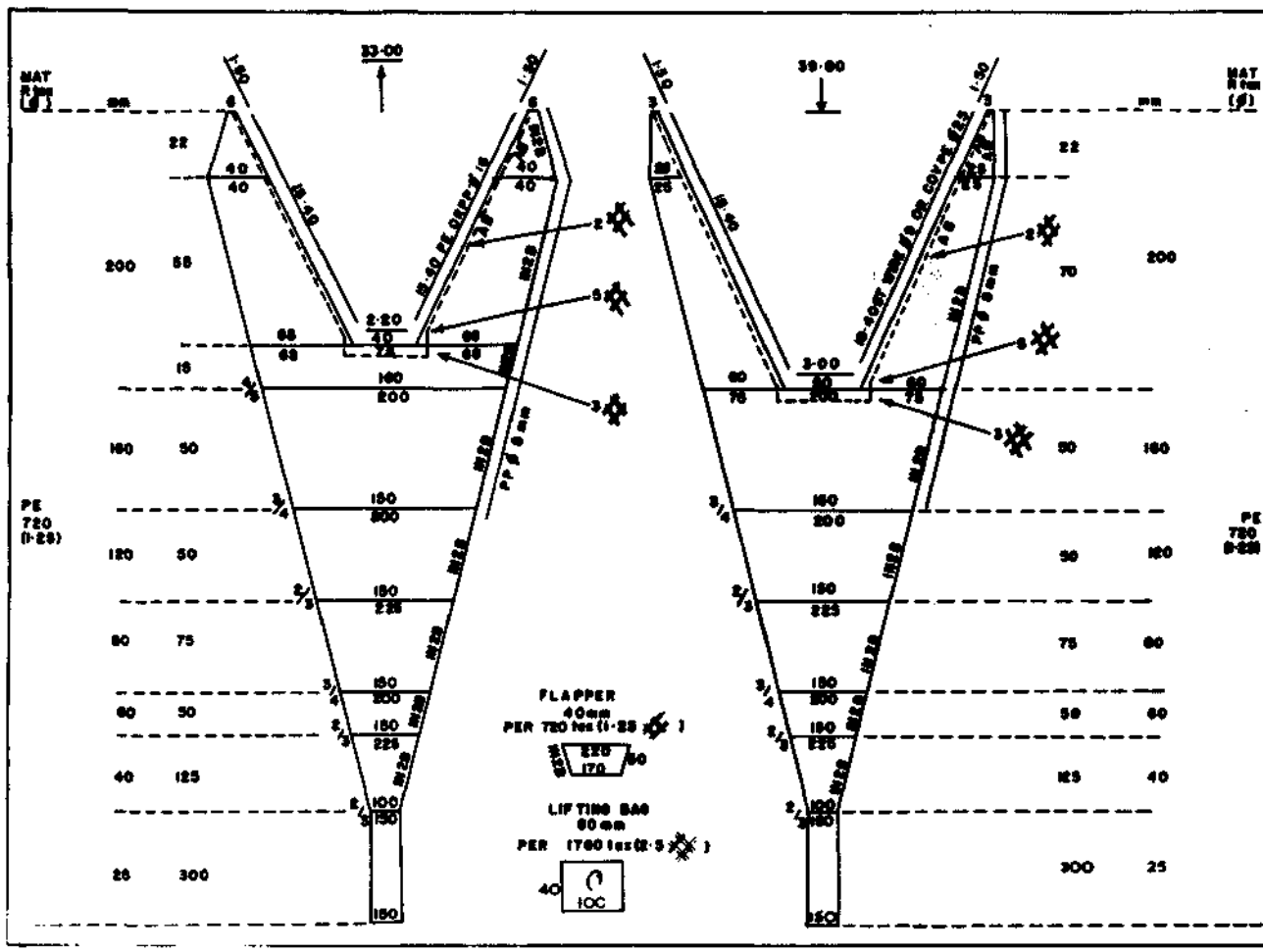


Fig. 2. The net design of the two-boat high opening bottom trawl.

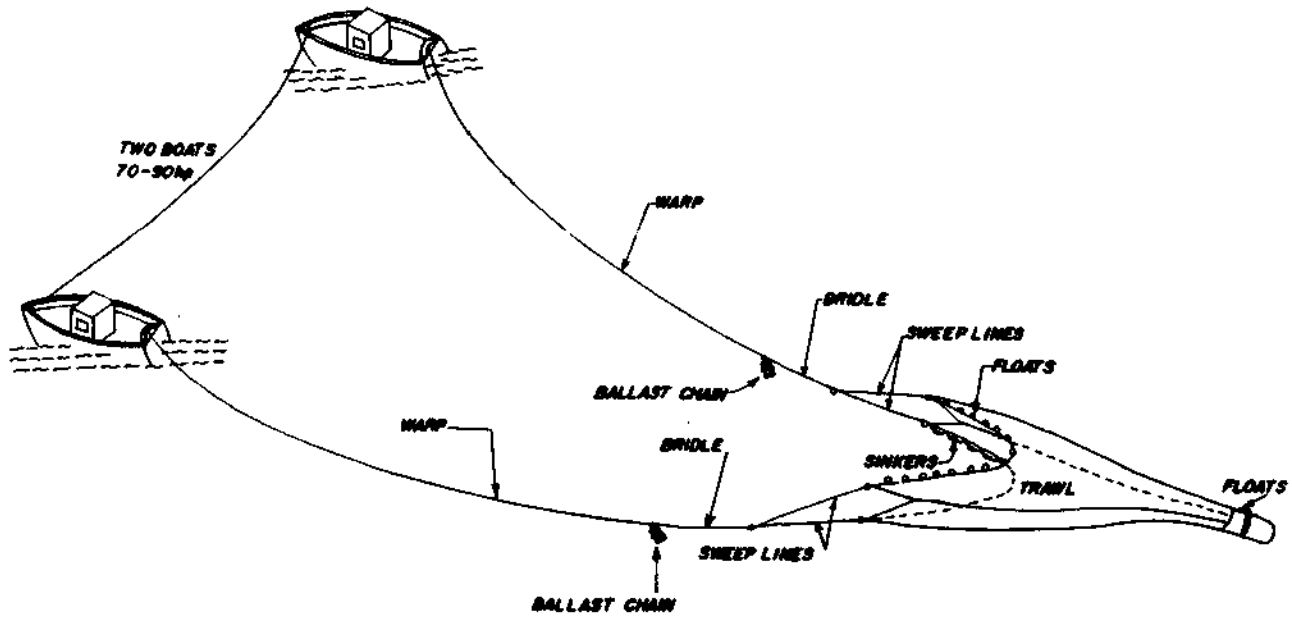


Fig. 3. The diagrammatic sketch showing the pair trawling operations.

Fig. 3. Two boats of identical size and horse power are employed.

**Results of operation**

The number of units operated and catch particulars of pair trawling conducted off Rameswaram and Mandapam during February to April 1982 are furnished in Table 1. While 384 units conducted trawling in February, it increased to 650 units in March. In April the number of units, however, declined. The total estimated landings of fishes during these three months was 1,166.7 tonnes and the catch per unit effort 1,093.4 kg. The maximum yield of 761.26 tonnes and yield rate of 1.17 tonnes is observed in March (Fig. 4).

**Catch composition**

The percentage composition of the dominant groups of fishes (Fig. 5) shows that pomfrets and rainbow sardines were landed more or less in equal proportions. *Dussumieria* spp. (mostly *Dussumieria acuta* Valenciennes) constituted 29.95% of the total catch closely followed by silver pomfret, *Pampus argenteus* (29.66%). Stray catches of black pomfret, *Parastromateus niger* (Bloch) were also present. Sciaenids and cat fishes formed 17.55% and 9.32% respectively. Other important groups landed were silver bellies (5.75%), rays (4.79%) and miscellaneous fishes, mainly *Pellona* spp., *Hilsa* spp., *Ilisha* spp., Carangids and lesser sardines other than rainbow sardines (2.98%).

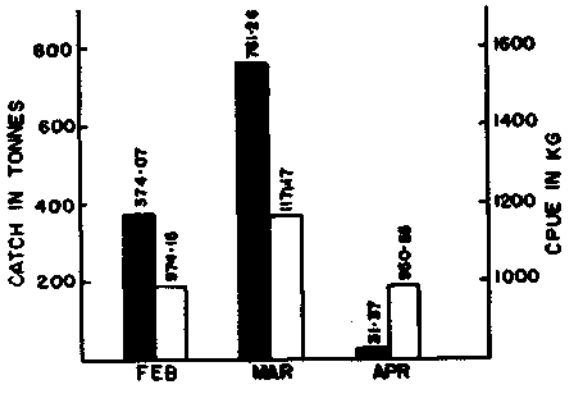


Fig. 4. Total catch (■) and catch per unit effort (□) of all categories of fishes landed.

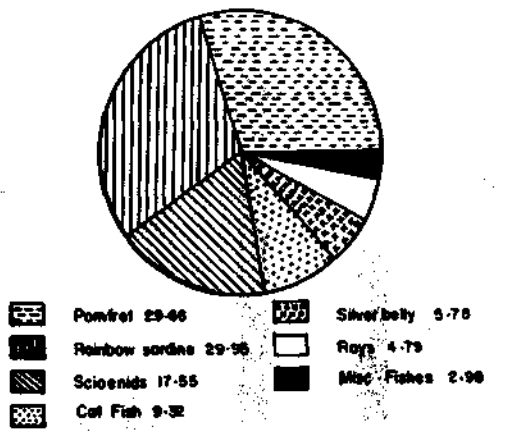


Fig. 5. Percentage composition of dominant groups of fishes landed by pair trawling.

Table 1. *Total catch in tonnes and catch per unit effort in kg (in parenthesis) of dominant groups of fishes landed by pair trawling operations during February to April 1982.*

| Months | No. of units operated | Pomfrets | Rainbow sardines | Sciaenids | Catfishes | Silver bellies | Rays | Misc. fishes | Total catches |
|---|---|---|---|---|---|---|---|---|---|
| February | 384 | 113.13 (294.62) | 114.58 (298.37) | 76.59 (199.45) | 9.12 (23.76) | 13.93 (36.28) | 28.70 (74.74) | 18.02 (46.94) | 374.07 (974.15) |
| March | 650 | 226.88 (349.05) | 225.24 (346.53) | 124.20 (191.07) | 95.05 (146.22) | 48.12 (74.02) | 27.29 (41.98) | 14.48 (22.28) | 761.26 (1,171.17) |
| April | 33 | 6.06 (183.85) | 9.67 (292.93) | 3.97 (120.21) | 4.57 (138.39) | 5.00 (151.52) | - - | 2.10 (63.64) | 31.37 (950.55) |
| Total | 1,067 | 346.07 (324.35) | 349.49 (327.54) | 204.76 (191.89) | 108.74 (101.91) | 67.05 (62.83) | 55.99 (52.47) | 34.60 (32.43) | 1,166.70 (1,093.45) |

**Observations on silver pomfret**

Catch trends

As can be seen from Table I and Fig. 5 silver pomfret forms one of the two predominant constituents. During the three months of pair trawling operations an estimated 346.07 tonnes of pomfrets were landed by 1,067 units with a catch per unit effort of 324.35 kg. Pomfrets occurred in February with fairly good catch rate of 294.62 kg. The maximum catch (226.88 tonnes) and catch rate (349.05 kg) was in the month of March. The fishing gradually came down to a catch rate of 183.85 kg and abruptly ended by the middle of April (Fig. 6).

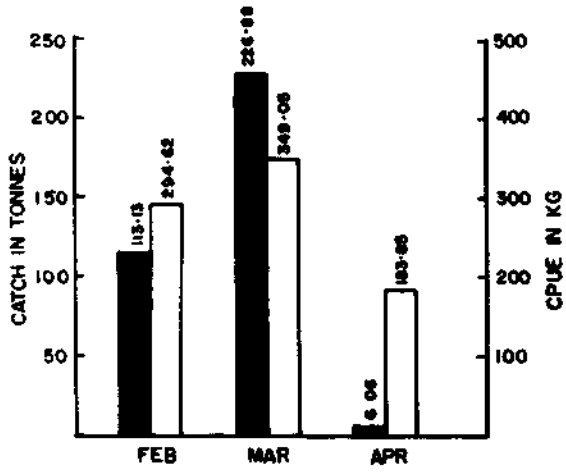


Fig. 6. Total catch (■) and catch per unit effort (□) of pomfrets.

Area-wise catch particulars are not available, making it difficult to assess the relative abundance of pomfrets in the ground. However, through information gathered from fishermen the sub-areas 9-79/3C and 9-79/4C (Fig. 1) appear to be more productive.

**Biological Observations**

Data on length of the pomfrets were collected for the month of March. The catches consisted of fish ranging from 145 to 280 mm size with the dominant size group at 235 mm. Examination of the stomach contents collected from representative samples indicated that the fishes have been feeding mostly on crustaceans apart from larval bivalves, gastropods and polychaetes. Most of the specimens examined were in the II, III and IV stages of maturity.

**Marketing**

During the peak period of the fishery, in the latter half of March, marketing of pomfrets was a problem faced by the fishermen. About 10 percent of the pomfrets caught weighed each 350 g and above, about 80 percent weighed in the range of 200 to 250 g each and the rest less than 200 g. The demand by the small traders for fresh fish in the nearby markets was far less compared to the aggregate supply. Hence bulk quantities of pomfrets were iced and sent to Madras, Trichy, Madurai, Coimbatore, Pollachi, Pudukottai, Karaikudi, Paramakudi and parts of Kerala. The Tamilnadu Fisheries Development Corporation (TNFDC) also came into the picture, procuring pomfrets from Rameswaram centre for sale at Madras. However, the number of commission agents and wholesale merchants involved in fish trade was comparatively less and the aggregate market demand was fully controlled by them, resulting in a lack of demand for pomfrets during the peak period. Thus the price declined from Rs 10/- per kg during first week of February to Rs 6/- per kg during the first half of March and Rs 4/- per kg during the latter half of March, when there were maximum catches. The fishermen

**Table 2.** *Average price per kg for different varieties of fish at the landing centre in Rameswaram and Mandapam (February-March 1982)*

| Sl. No. | Name of fish/species | Average Price Rs/kg |
|---|---|---|
| 1. | Pomfrets | 6.00 |
| 2. | Rainbow sardine | 1.00 |
| 3. | Catfish | 1.50 |
| 4. | Rays | 0.80 |
| 5. | *Thryssa* sp | 0.75 |
| 6. | Silver bellies | 0.60 |
| 7. | *Saurida* sp | 1.25 |
| 8. | *Sardinella* spp | 0.90 |
| 9. | *Upeneus* sp | 1.75 |
| 10. | Sciaenids | 1.50 |
| 11. | *Chirocentrus* sp | 2.50 |
| 12. | *Scomberomorus* spp | 7.00 |
| 13. | *Drepane punctata* | 1.00 |
| 14. | *Lactarius lactarius* | 3.00 |
| 15. | *Hilsa* sp | 0.40 |
| 16. | *Trichiurus* sp | 1.25 |
| 17. | Polynemus | 1.25 |
| 18. | Cephalopods | 4.00 |
| 19. | *Ilisha* sp | 1.25 |
| 20. | *Cynoglossus* sp | 2.00 |
| 21. | *Sillago* sp | 1.25 |
| 22. | Misc. | 1.00 |

could not even get enough ice to preserve the unsold pomfrets during the peak period. The average prices per kg received by the fishermen at the landing centre for different varieties of fish are given in Table 2. The lesser sardines, silverbellies and other clupeids were salted and sun dried to meet the demands of the lucrative interior markets in Kerala and Tamil Nadu.

**Employment**

The man power employed in pair trawling during the peak period of March 1982 was about 500 in Mandapam and Rameswaram region. Those engaged in pair trawling were previously doing the usual trawl fishing. The change in fishing pattern during this period was mainly due to comparatively lesser returns in trawl fishing and high profitability of pair trawling. About 200 persons got additional employment in the subsidiary activities such as handling, transportation, drying and curing during the peak period.

**Operational cost and returns**

The number of persons engaged in fishing with the high opening bottom trawl nets ranged from 10 to 12 per unit. The payment of wages for the fishermen were in two ways, one is fixed wages given to the crew irrespective of the catch, and the other the sharing system wherein 35 to 40 per cent of the net income is divided among them in addition to the daily allowance of Rs 5/- to Rs 15/- per head. Detailed information regarding the operational costs such as diesel and lubricating oil expenditure, wages to the crew members and shore costs were collected. The average operational expenditure per trip of pair trawlers, following the fixed wage system is given in table 3 and it works out to about Rs 1,200/- excluding the interest for capital investment, depreciation, insurance and repairing and maintenance charges.

Based on the average species-wise catch per trip (Table 1) and the price per kg at the landing centre (Table 2) the gross income has been computed to Rs 2,800/- per trip. However, during the first week of April all the pair trawlers shifted again to trawl fishing as the catch rate of pomfrets declined and as the prawn fishery became more profitable.

**Remarks**

The introduction of mechanised fishing in the east coast over the past twenty years has brought out changes not only in the pattern of fishing but also in the industry as well in many areas. Palk Bay is one such zone, which has been changing in recent years as far as the pattern of fishing is concerned. This area is well known for its rich traditional fisheries like lesser sardines, silver bellies, seer fish, perches and squids among others. In recent years commercial scale trawling operations in this area by mechanised boats have established an important prawn fishing industry in and around Rameswaram Island. The present fishing effort by pair trawling, a new venture for the fishermen of this area, is yet another diversification in fishing. This would definitely indicate future possibilities of large scale seasonal fishery for pomfrets from these waters. The trend of these operations and the landings in the coming years will be watched with special interest.

In this context it may be mentioned that pomfrets constitute only 3% of the total marine fishing landings in India (*Mar. Fish. Infor. Serv. T & E Ser.* No. 32, 1981). In the east coast, Tamil Nadu ranks only third

**Table 3.** *Average operational expenditure per trip of pair trawlers*

| | Item | Qty or Nos. | Rate (Rs) | Amount (Rs) |
|---|---|---|---|---|
| 1. | Diesel | 250 litres | 3.18 | 795 |
| 2. | Lubricating oil | 3 litres | 14.00 | 42 |
| 3. | *Crew members* | | | |
| | a. Drivers | 2 Nos. | 35.00 | 70 |
| | b. Asst. Drivers | 2 " | 30.00 | 60 |
| | c. Luskers | 8 " | 20.00 | 160 |
| 4. | *Shore cost* Assistants | 4 " | 15.00 | 60 |
| 5. | Misc. | - | - | 15 |
| | Total | - | - | 1,202 |

in importance for pomfret landings. A fishery comprising of *Pampus argenteus, Parastromateus niger* and *Pampus chinensis* has been known from the strip of Coromandel coast stretching north of Vedaranyam up to Arcatthurai by the traditional gear. In Rameswaram Island and in the vicinity sporadic catches have been reported in the past from gill nets and bottom set nets. Trawl fishing in recent years are also known to bring in stray catches of pomfrets. Therefore such huge landings of pomfret as observed during February to April by pair trawling conducted off Rameswaram, Pamban and Mandapam are quite a significant feature and this is the first time that such heavy landings have been reported here. It would seem that this valuable resource was not being exploited all these years because of lack of a suitable fishing gear to capture the shoals which might have been migrating to this area seasonally. It remains to be seen whether in the coming years pair trawling operations during the particular period would bring in pomfrets in such large quantities as to make it an additional regular seasonal fishery.

At a future time if such seasonal fishery of quality table fishes is established, measures should be taken to ensure reasonable prices for the fishermen. It is suggested that the Tamil Nadu Fisheries Development Corporation should either take necessary steps to procure the entire quantity of quality fishes at times of unusual catch abundance or some other measure has to be evolved so that the middlemen would not exploit the fishermen.

The objective behind the introduction of two-boat trawling is to maximise catch. The high percentage occurrence of the lesser sardines in the catch is yet another pointer to the usefulness of the gear in exploiting different resources, especially in view of the fact that the popular shore-seine fishing which used to be one of the main tackles for landing them, has virtually disappeared following the intensification of mechanised fishing. With the intensive operation of the gear in coming years it is likely that more of these resources might be exploited, when proper utilisation of the same may also have to be considered.